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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/552,908	10/13/2005	Ulrich Weidmann	HAM P2073	6964

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HUNTSMAN ADVANCED MATERIALS AMERICAS INC.
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EXAMINER

MCCULLEY, MEGAN CASSANDRA

ART UNIT	PAPER NUMBER
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1796

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/552,908	Applicant(s) WEIDMANN, ULRICH	
	Examiner Megan McCulley	Art Unit 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 August 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5,8-11 and 13-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5,8-11 and 13-15 is/are rejected.
- 7) ☒ Claim(s) 2-5,9-11 and 15 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

Claims 2-5, 9-11, and 15 are objected to because of the following informalities: there is a typographical error; the word "claim" should not be capitalized. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goswami et al. (U.S. Pat. 4,652,398) in view of Blyakhman (U.S. 5,591,811).

Regarding claims 1-5: Goswami et al. teaches a mixture of an imidazole compound at 2 parts by weight and 2,2' diallyl bisphenol A, which is o,o'-diallyl bisphenol A, (Example 2 col. 6-7) in an amount of 7 parts by weight. This is a ratio of 22:78 of the imidazole component to phenol component. While the exact claimed range is not disclosed, a *prima facie* case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985).

Goswami et al. does not teach using the imidazole of general formula (I). However, Blyakhman teaches a compound of general formula (I) of the instant application where R₁, R₂, and R₃ are each independently of the other hydrogen; alkyl of

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1 to 12 carbon atoms; cycloalkyl of 3 to 12 carbon atoms, which could be substituted by alkyl groups of 1 to 4 carbon atoms; cycloalkyl-alkyl of 4 to 20 carbon atoms which can be substituted by alkyl groups of 1 to 4 carbon atoms; aryl of 6 to 10 carbon atoms, which could be substituted by 1 to 3 alkyl groups of 1 to 4 carbon atoms; phenylalkyl of 7 to 15 carbon atoms, which could be substituted by 1 to 3 alkyl groups of 1 to 4 carbon atoms; alkenyl of 3 to 12 carbon atoms; alkynyl of 3 to 12 carbon atoms; aromatic or aliphatic acyl group of 3 to 12 carbon atoms or alkyl or aryl of 3 to 12 carbon atoms containing a cyano group or a halogen; R4, R5, R6, R7, R8, and R9 are each independently of the other hydrogen; alkyl of 1 to 12 carbon atoms; cycloalkyl of 3 to 12 carbon atoms, which can be substituted by alkyl groups of 1 to 4 carbon atoms; cycloalkyl-alkyl of 4 to 20 carbon atoms, which can be substituted by alkyl groups of 1 to 4 carbon atoms; aryl of 6 to 10 carbons atoms, which can be substituted by 1 to 3 alkyl groups of 1 to 4 carbon atoms; phenylalkyl of 7 to 15 carbon atoms, which can be substituted by 1 to 3 alkyl groups of 1 to 4 carbon atoms; alkenyl of 3 to 12 carbon atoms; alkynyl of 3 to 12 carbon atoms; halogen; alkoxy of 1 to 12 carbon atoms; or hydroxyl (formula (I) and col. 2 line 59- col. 3 line 16). Goswami et al. and Blyakhman are analogous art because they are both concerned with the same field of endeavor, namely epoxy resins containing imidazoles and phenols. At the time of the invention a person having ordinary skill in the art would have found it obvious to combine the imidazole taught in Blyakhman with the composition of Goswami et al. and would have been motivated to do so because 1-imidazolylmethyl-2-naphtols are effective catalysts

for curing epoxy resins and provide epoxy resin systems with prolonged room temperature stability and fast curing as stated by Blyakhman (abstract).

Claims 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blyakhman (U.S. 5,591,811) in view of Goswami et al. (U.S. Pat. 4,652,398) and Klein et al. (U.S. 6,245,835).

Regarding claim 8: Blyakhman teaches a compound of general formula (I) of the instant application where R₁, R₂, and R₃ are each independently of the other hydrogen; alkyl of 1 to 12 carbon atoms; cycloalkyl of 3 to 12 carbon atoms, which could be substituted by alkyl groups of 1 to 4 carbon atoms; cycloalkyl-alkyl of 4 to 20 carbon atoms which can be substituted by alkyl groups of 1 to 4 carbon atoms; aryl of 6 to 10 carbon atoms, which could be substituted by 1 to 3 alkyl groups of 1 to 4 carbon atoms; phenylalkyl of 7 to 15 carbon atoms, which could be substituted by 1 to 3 alkyl groups of 1 to 4 carbon atoms; alkenyl of 3 to 12 carbon atoms; alkynyl of 3 to 12 carbon atoms; aromatic or aliphatic acyl group of 3 to 12 carbon atoms or alkyl or aryl of 3 to 12 carbon atoms containing a cyano group or a halogen; R₄, R₅, R₆, R₇, R₈, and R₉ are each independently of the other hydrogen; alkyl of 1 to 12 carbon atoms; cycloalkyl of 3 to 12 carbon atoms, which can be substituted by alkyl groups of 1 to 4 carbon atoms; cycloalkyl-alkyl of 4 to 20 carbon atoms, which can be substituted by alkyl groups of 1 to 4 carbon atoms; aryl of 6 to 10 carbons atoms, which can be substituted by 1 to 3 alkyl groups of 1 to 4 carbon atoms; phenylalkyl of 7 to 15 carbon atoms, which can be substituted by 1 to 3 alkyl groups of 1 to 4 carbon atoms; alkenyl of 3 to 12 carbon

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atoms; alkynyl of 3 to 12 carbon atoms; halogen; alkoxy of 1 to 12 carbon atoms; or hydroxyl (formula (I) and col. 2 line 59- col. 3 line 16) in the amount of 2-25 parts by weight. Blyakhman further teaches an epoxy resin (abstract) made of a bisphenol A, which has 2 epoxy functional groups per molecule at a molecular weight range of 1000 to 1500 (col. 5 lines 5-10). This corresponds to an epoxide equivalents range of 0.5 to 0.75 epoxide equivalents/kg. Blyakhman also teaches adding a curing agent for the epoxy resin and one or more additives (col. 5 lines 41-53).

Blyakhman does not teach a phenol at the weight ratio of imidazole to phenol of 25:75 to 50:50. However, Goswami et al. teaches a mixture of an imidazole compound at 2 parts by weight and 2,2' diallyl bisphenol A, which is o,o'-diallyl bisphenol A, (Example 2 col. 6-7) in an amount of 7 parts by weight in an epoxy resin composition. This is a ratio of 22:78 of the imidazole component to phenol component. While the exact claimed range is not disclosed, a *prima facie* case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985). At the time of the invention a person having ordinary skill in the art would have found it obvious to combine the imidazole taught in Blyakhman and the composition of Goswami et al. and would have been motivated to do so because 1-imidazolylmethyl-2-naphthols are effective catalysts for curing epoxy resins and provide epoxy resin systems with prolonged room temperature stability and fast curing as stated by Blyakhman (abstract)

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and the diallybisphenol A and imidazole combination lead to excellent bond strength, as evidenced by Goswami et al. (col. 7 lines 14-23).

Blyakhman also does not teach the curing agent to have 0.5 to 1.5 functional groups per epoxide group. However, Klein et al. teaches a curing agent for an epoxy resin having 0.5 to 2 functional equivalents per epoxy group (col. 11 lines 38-46). Blyakhman and Klein et al. are analogous art because they are both concerned with the same field of endeavor, namely cured epoxy resins with an imidazole catalyst. At the time of the invention a person having ordinary skill in the art would have found it obvious to combine the functional group ratio of Klein et al. with the composition of Blyakhman and would have been motivated to do so because with this ratio of functional groups the composition will not have much excess unreacted epoxy resin or curing agent, which would lead to decreased viscosity.

Regarding claim 9: Blyakhman and Klein et al. both further teach a polyamine curing agent (Blyakhman col. 5 lines 41-48 & Klein et al. col. 16 lines 14-49).

Regarding claim 10: Klein et al. further teaches a polyoxypropylenediamine curing agent (col. 16 line 38). At the time of the invention a person having ordinary skill in the art would have found it obvious to use a polyoxypropylenediamine as a polyamine curing agent and would have been motivated to do so because polyoxypropylenediamine is more reactive curing agent for epoxy resins.

Regarding claim 11: Blyakhman teaches using cycloaliphatic epoxy resins (col. 3 lines 17-48).

Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Das et al. (U.S. 5,922,448) in view of Blyakhman (U.S. 5,591,811) in further view of Goswami et al. (U.S. Pat. 4,652,398).

Regarding claim 13: Das et al. teaches adding an epoxy resin (abstract), curing agent/catalyst (col. 8 lines 29-54), a phenol and an imidazole at a weight ratio of imidazole to phenol of 15:85 to 25:75 to make a curable composition (col. 9 line 40-col. 10 line 7).

Das et al. does not teach adding the compound of general formula (I). However, Blyakhman teaches adding the compound of formula (I) to an epoxy resin (col. 4 lines 54-58), a curing agent (col. 5 lines 41-48) and a phenol (col. 5 lines 41-48). At the time of the invention a person having ordinary skill in the art would have found it obvious to add in the imidazole of general formula (I) with the composition of Das et al. and would have been motivated to do so because 1-imidazolylmethyl-2-naphthols are effective catalysts for curing epoxy resins and provide epoxy resin systems with prolonged room temperature stability and fast curing as stated by Blyakhman (abstract).

Das et al. does not teach the specific phenols of the instant application. However, Goswami et al. teaches an epoxy resin, 2,2'-diallyl bisphenol A (o,o'-diallyl-bisphenol A) and an imidazole (Example 2). At the time of the invention a person having ordinary skill in the art would have found it obvious to combine the o,o'-diallyl-bisphenol A of Goswami et al. with the composition of Das et al. and would have been motivated to do so for such desirable properties as an excellent bond strength as discussed in Goswami et al. (col. 7 lines 14-23).

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Regarding claim 14: Das et al. further teaches dissolving components before curing at a temperature of 65-75 °C (col. 9 lines 39-52).

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Blyakhman (U.S. 5,591,811) in view of Goswami et al. (U.S. Pat. 4,652,398) and Klein et al. (U.S. 6,245,835) as applied to claim 8 above and in further view of Das et al. (U.S. 5,922,448).

Regarding claim 15: Blyakhman teaches the basic claimed composition as set forth above. Not disclosed is the prepreg. However, Das et al. teaches a prepreg comprising a similar composition (col. 10 lines 40-60). Blyakhman and Das et al. are combinable because they are both concerned with the same field of endeavor, namely epoxy resins containing imidazoles and phenols. At the time of the invention a person having ordinary skill in the art would have found it obvious to make a prepreg with the composition and would have been motivated to do so because it is known in the art that an application for epoxy resins is prepregs.

Response to Arguments

Applicant's arguments with respect to claims 1-5, 8-11, 13-15 have been considered but are moot in view of the new ground(s) of rejection. However, discussed below are remarks to applicant's arguments which are pertinent to the rejection above.

A) Applicant's argument that Zahir et al. teaches away from a larger ratio of imidazole to phenol since as the examples in Zahir et al. increase the ratio, the flexural strength decreases. Therefore, the Zahir et al. reference has been removed.

B) Applicant's argument that there are unexpected results in terms of high interlaminar shear strength is not persuasive. The experiments shown in the specification are not commensurate in scope with the claimed invention. Comparison is made in Table 2 between a composition comprising only the claimed imidazole compound and a composition comprising the claimed imidazole compound and the claimed phenol in a ratio of 30:70. However, only one embodiment of imidazole is presented, only one embodiment of the phenol is presented and only one ratio out of the claimed range is presented. Therefore, it is unclear if the increased values of interlaminar shear strength are unexpected or merely better. More data points are needed to show unexpected results.

Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Megan McCulley whose telephone number is (571)270-3292. The examiner can normally be reached on Monday - Friday 7:30-5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Eashoo can be reached on (571) 272-1197. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mark Eashoo, Ph.D./
Supervisory Patent Examiner, Art Unit 1796
28-Aug-08

/M. M./
Examiner, Art Unit 1796